

Each year, after 1965, many people wanted to immigrate to the U.S., many more than the 290,000 limit. This led to the Immigration Act of 1990. The Immigration Act of 1990 raised the yearly limit from 290,000 to 700,000. However, from 1990 to the present, the actual number has been closer to 1 million, one reason for this being that the U.S. needs workers for many of its service jobs, such as in restaurants or hotels or in farming.

In recent years, many people in the U.S. have come to realize that the country's greatest strength is the **diversity** of its people. So, the old melting pot ideal has been replaced with the ideal of cultural diversity, with recognizing the importance of Americans' many different cultural backgrounds. You can see this today in strong communities that are Korean-American, Japanese-American, Italian-American, Mexican-American, and so on. Any questions about this? Susan?

STUDENT 3: I'm confused. I thought the melting pot was a good thing, that people should mix together and form a strong society.

TEACHER: Yes, I think you're right—we do want to mix together and form a strong society. But now the metaphor is that we want to have a mixed salad, where each ingredient keeps its original flavor, too. Does that sound like a good thing?

STUDENT 3: Yes, it makes sense.

TEACHER: Well, let's sum up. There were several waves of immigration into the U.S. The earlier waves were mostly Europeans, while the later waves have been mostly people from Latin America and Asia. The main reason has always been economic; they are looking for better jobs and a better life than they had in their home country. In the next class, I'm going to talk about current immigration laws. We'll start there next time. That's all for today.

Unit 7 Who's Calling the Shots?

TEACHER: Good morning. Hope you had a good weekend. Today we're going to start talking about **styles** of business management. Styles of management vary from country to country, company to company, and, from person to person. One approach to good management now considered important worldwide is team building. Team building is only part of what makes someone a good manager, but it **underlies** many good management practices.

When team building, the manager does things to help employees work together effectively as a group, as a team.

This is based on the idea that the manager's job isn't simply to tell people what to do, but to help solve problems and help people communicate so they work well together. This approach emphasizes employee relations, and it **benefits** the company.

It hasn't always been this way. Not so many years ago there was an attitude in American companies, of "What the manager says, goes." Employees were expected to do what they were told. But we're seeing a new **paradigm** because companies have realized that employees don't do their best work when they're treated like this. This was a big change in American management style, perhaps influenced by the Japanese model.

First, in order to build a team, a good business manager knows that different people are good at different things and **values** the special skills that each employee brings to the company. A good manager needs to find a way to let the employees know that their particular skills are important to the company. The employees are then more likely to do their best when they feel valued, and value each other. A strong manager knows how to build a team of employees who help each other do their best work.

So, what can a manager do to help employees feel they're valued, like part of the team? Let's consider a situation at a company called the ABC company. Let's say there's a new manager in the office, Mrs. Gomez, and she's made some changes. One day, an employee—Mrs. Parks—decides to approach Mrs. Gomez about some problems she is having at work. Mrs. Parks has worked at the company for more than ten years. The new changes make it difficult for her to do her job well. She's stressed, and this is affecting her job performance.

So, Mrs. Gomez and Mrs. Parks talk. Mrs. Gomez listens. She knows she has made some changes, and that the office isn't being run like it was before. But she tells Mrs. Parks to try her best, and to give it more time. Oh, I see a question. Anna?

STUDENT 1: I'm not clear. What kind of changes are you talking about?

TEACHER: Oh. Well, let's say one change is that, before, you gave a rough draft of your report to the secretary, and she edited it and sent it out. Now, the secretary doesn't do this for you. You have to do it yourself. She changed the way the office was organized.

STUDENT 1: Oh, OK.

TEACHER: Later that night, Mrs. Gomez thinks about what Mrs. Parks said. She thinks it's possible that other people in the office are having problems, too. Mrs. Gomez knows that she needs a strong team to be a successful manager. She also needs a **stable** group of

employees. She doesn't want people to leave. She decides she needs to get an **accurate** idea of the employees' **perspectives**. She decides to give the employees an opportunity to share their ideas. She wants to show them she values their work and their experience at the company.

So, Mrs. Gomez makes a team-building plan. She begins by scheduling a meeting for the next day to talk about the changes she has made, to give the employees an opportunity to say what problems they're having and to ask questions. At the end of the meeting, she gives the employees some questions to answer in writing to make it easy for them to share their ideas. She tells them she will use the answers they write and the ideas from the meeting to decide on the next step in the office.

Let's consider the kind of questions she gives them. She wants questions that focus on the work itself, questions that would be easy for an employee to answer honestly. Questions like:

- A. Is it clear to you what your **responsibilities** are?
- B. Do you know who to talk to if a task is unclear?
- C. Do your team members support you? If not, what specific things could they do to help you do a better job?
- D. What was done in the past that you think worked better?

These questions are about the work, about how the office is **organized**, and about working together. They don't focus on the employee's feelings about the manager.

Mrs. Gomez reads their answers to the questions. She also checks her notes from the meeting. She decides to **modify** the way she has reorganized the office. Not big changes—just a few small ones. She realizes that some of the old ways were better. So, she makes a few changes back to how the office was organized before. She also comes up with a six-month plan for improvement, and tells the employees they will all review the plan together in six months.

What message is she communicating to the employees by these actions? Well first, she's telling them she considers their ideas important; she values their opinions. Second, she is telling them she is in charge, but she values what they say. Third, she's telling them that change is not necessarily good if there is no good reason for it. In other words, she didn't need to make so many big changes when she started as manager. And, finally, she is telling them that she is human, that she can admit her mistakes, and that she is willing to do what benefits the group. This puts her on the road to gaining their support, and to being a successful manager.

Now, on to the third part of her plan. Mrs. Gomez plans a picnic at the park near their office. They have lunch,

play games, and talk. They laugh and joke and relax. By the end of the day, they know each other better. Hopefully, this will help them work together better, as well.

Let's review the three parts of Mrs. Gomez's team-building plan: She had a meeting, she gave employees questions about the office organization, and she planned a fun activity to help them get to know each other. We can see that her plan is based on the importance of solving problems, and on the belief that communication is **vital** in order to succeed as a team. This is a key point: Her plan is based on the idea of solving problems and employees sharing ideas.

Any questions? Felipe?

STUDENT 2: Well, I've studied some business management courses, and I understand that it's important to develop communication and build up team players, but isn't it just a waste of time to have these "fun" activities?

TEACHER: Well, a lot of managers do think it's a waste of time, especially in the short term. But, in the long run, it's definitely not a waste of time. In fact, it's often a great way to save time in team building.

Let's stop here. Today we discussed team building and why it has become important. In the next class, I want to talk about other group activities managers can use to build a team. We'll start there next time. That's all for today.

Unit 8 Right and Wrong on the Net

TEACHER: Good morning. Did anyone hear the news about the teenager in New York who hacked into a bank's database and stole about 30,000 credit card numbers over the weekend? Hacking is related to computer ethics—that's our topic today.

Computer ethics deals with the proper use of information technology, such as computers and the Internet. By proper use, I mean socially responsible use. We'll first talk about what ethical behavior is and how this applies to computer use.

First, I want to make sure we all know what ethics is. Anyone? Yes, John.

STUDENT 1: It's about right and wrong.

TEACHER: Yes. OK, Jennifer.

STUDENT 2: And it's about being a good person, doing what's right.

TEACHER: Yes, ethics includes both of these ideas. It deals with moral **judgments**, with what is **acceptable** or unac-

ceptable to do. Now we learn ideas about what is right and wrong from our families, our friends, and from the culture we live in. Because of differences in our backgrounds, we may not always agree on what is right and wrong.

However, for our discussion today, I will define for you what I mean by an ethical action. An ethical action is something someone does that benefits someone and doesn't hurt anyone. So, for example, if you see a man drop some money, and you pick the money up and give it to him, this is an ethical action. On the other hand, if you pick up the money and don't give it back to the man, this benefits you, but hurts the man. This is not an ethical action.

Now what about computers? What are the ethical boundaries for using computers and the Internet? Most people agree that it is wrong to steal from a store. Would they also say it's wrong to copy music files from the Internet? Or, to take another example, most people agree that it is wrong to open an envelope and read a letter to someone else. Would they also say it's wrong to read someone else's e-mail?

In the past *decade* or so, many more people have started using computers and the Internet, so these issues have become important. In 1992, the Computer Ethics Institute was founded in the United States. This is a research, education, and policy study group whose goal is to increase awareness of the ethical issues that are likely to come up as technology develops.

One concept the Computer Ethics Institute has developed is the Ten Commandments of Computer Ethics. These rules are important *guidelines* the Institute thinks all computer users should follow. Now some of you may be familiar with the Ten Commandments from the Bible, like, uh, "Thou shalt not kill" or "Thou shalt honor thy father and thy mother." The Ten Commandments of Computer Ethics have been written in the same style of language used in the Ten Commandments from the Bible. For example, they use the phrase "Thou shalt not." "Thou shalt not" means don't or you shouldn't.

Let's look at each commandment or rule.

The first commandment says: Thou shalt not use a computer to harm other people. Simple enough, right?

Number Two. Thou shalt not *interfere* with other people's computer work. I interpret this to mean don't use a computer in any way that will affect or change the work someone else is doing. Don't move or *edit* someone else's files without telling them.

Number Three. Thou shalt not snoop in other people's files. To snoop means to try to find out something with-

out another person knowing it. If you look at someone else's files on the computer or read their e-mail, you're snooping. Respect other people's *privacy*.

Number Four. Thou shalt not use a computer to steal. There are situations on the Internet in which you have to decide if you are stealing or not, like downloading music files, as I mentioned earlier.

Number Five. Thou shalt not use a computer to say things that are untrue. It is up to you to be truthful in your website, in your e-business, and in your e-mail.

Number Six. Thou shalt not use software for which you have not paid. In other words, if the software is free on the Internet, it's okay to download and use it. However, it is not okay to copy software from a friend, because you didn't pay for it.

Number Seven. Thou shalt not use other people's computer resources without telling them, or without paying them. For example, you shouldn't use someone else's computer, password, or Internet connection without asking them first.

Number Eight. Thou shalt not appropriate someone else's ideas. Appropriate is spelled A-P-P-R-O-P-R-I-A-T-E. . . . It means to take words someone else wrote and say they're yours. Uh, for example, you have to write a report for school. If you copy a term paper from the Internet and hand it in, you're breaking the rule. Copying even a few sentences off the Internet and presenting them as your own is breaking the rule.

Number Nine. The ninth commandment says: Thou shalt think about the social *consequences* of the program you are writing. Now, this applies mostly to computer programmers. Social consequences means how the program you're writing might affect others in society. Could hackers possibly use your program to illegally gain access to a computer system? Skillful hackers can hack into banks and into credit card companies; they can *alter* accounts and steal money. They can also create viruses that can cause billions of dollars of damage worldwide.

Number Ten. The tenth commandment says: Thou shalt always use a computer in ways that are respectful of others. For example, sending unfriendly e-mail to someone or about someone or creating websites with negative messages are examples of breaking this rule.

OK, the Computer Ethics Institute has sent these guidelines to many large companies and to schools across the United States. However, there's no way to *enforce* these rules. Nevertheless, they would like to see schools, in particular, *utilize* these rules to help students develop a strong sense of computer ethics. OK, any questions or comments at this point?

STUDENT 1: How are we supposed to remember all those rules?

TEACHER: Well, there are a lot of rules, but they all boil down to a couple of principles: respect and fairness. Respect what belongs to others and use resources fairly. Does that help?

STUDENT 1: Yeah, I guess so.

TEACHER: Good. Let's go back to ethics. Now increasingly, schools are seeing that students need to be taught computer ethics as part of the school curriculum. Some schools have come up with acceptable-use policies, or rules about what is or isn't OK for students to do regarding computer use. This is how the Computer Ethics Institute would like to see schools utilizing the rules. Generally, it's considered wrong to steal someone else's password or to read someone else's e-mail. It's also considered unacceptable in college classes for a student to download a term paper off the Internet and pretend that he or she wrote it. This is called "plagiarism," and it's a good example of breaking rule number eight. Students are permitted to use the Internet for research, but are *instructed* to write the information in their own words and to explain where they got the information.

Now the ten rules are guidelines for us to follow. These rules help us to be aware of the ethical uses of technology. Let's stop here for today. Think about these rules this week and we'll talk about them. And read the next two chapters for next week.

Unit 9 Which Way Will It Go?

TEACHER: The topic for today's class is land as a resource. Land, water, trees, oil . . . these are all resources, and as future environmental scientists, you need to understand how to manage these resources. As the world population increases, managing land resources will become a greater priority. Land is a limited resource.

Today I'm going to divide the lecture into two parts. First we'll look at some of the factors contributing to pressures on the land we have, and then I want to turn to some of the ways people worldwide are trying to address land problems and meet the needs of future generations. Think of it as first the bad news, then the good news.

Let me start by saying there is less good *productive* land now than there was even ten years ago. By productive land I mean land that is fertile, that we can use to grow food and raise animals. Each year more and more land becomes degraded. We are losing productive land. Worldwide, new dry areas are developing and expanding. This is happening on every continent except Antarctica.

I don't mean existing deserts like the Sahara are getting bigger. I'm talking about new dry areas, areas where land has been *declining* in quality. You can see these areas in the map in your book. Why are these areas forming and expanding? What do you think? Theresa?

STUDENT 1: it's the climate, isn't it? the earth is getting, you know, hotter because of *global* warming. so water gets *evaporated* and the land dries out.

TEACHER: OK. Marcel, do you agree?

STUDENT 2: Well, yeah. It has to be the weather. What else could it be?

TEACHER: Well, different reasons have been given. Some people contribute it to global warming or to climate changes. They say nature simply produces dry regions, like the Sahara Desert, as well as wet regions, like the Amazon Rainforest. . . . Well, let's think about this. Is it only the weather? Let's see if there are other factors contributing to this *trend*.

Is nature, or the weather, really the problem? According to a large group of scientists, the weather isn't the main factor. Instead, they say, people are the main factor. When they say people are the main problem, they mean people's actions—how people use and manage land. Poor land management, overpopulation, poor farming techniques, too many animals, and so on, can all affect the land.

Look at the chart in your book. As you can see, researchers have identified several ways human activities contribute to the problem. The first is overgrazing by farm animals. They say about 35 percent of the loss of productive land is due to overgrazing by farm animals. The second is overcutting of trees, which leads to about 30 percent of the loss. And lastly, 28 percent of the loss of good land is from methods of farming. Overgrazing, overcutting, and farming methods. Let's look at these one at a time.

The first is overgrazing. Good topsoil is lost or damaged because of overgrazing by farm animals. Overgrazing means the animals eat too many of the plants. There are several bad results of overgrazing. First, there aren't enough plants left to hold the soil in place. Then, the topsoil is *eroded* by wind and rain; they carry it away. Second, as the animals walk around, the soil is *compacted*, and gets very hard. If the soil is too hard, rainwater isn't absorbed into the soil, and this causes the soil to stay dry and warm. As the soil gets drier, even fewer plants can grow. This, in turn, causes the animals to walk around more and more, in order to find enough food to eat. And, this causes the ground to get packed down even more, and get even drier, and so on. So, you can see that overgrazing can create this cycle.

Second, overcutting of trees also contributes to the loss of good land. The main problem is too many trees are cut and not replanted. For years we've heard about how this is happening on a large scale in the Amazon Rain Forest in Brazil. Trees, like land, are a resource we depend on. They're vital to the whole environmental balance on earth. If trees are cut down and not replanted, there is nothing to hold the good soil. Wind and water carry the good soil away and it erodes quickly, leaving land that is dry and less productive. So, overcutting is another reason why land quality is declining.

Third, farming methods are another big factor. In some places, traditional methods that have been used for hundreds of years no longer work well. Why do they no longer work well? Partly because the population is increasing, and farmers aren't **equipped** to meet these new demands, and partly because the soil is getting worn out. More people need to be fed from less land. As a result, some farmers may use too much fertilizer on the limited land they have, or not let the land rest from year to year, causing it to become less fertile. **Irrigation** is a huge factor many of us don't think about. Irrigation water often has salt in it, and when the salt builds up in the soil, the soil can no longer be used for farming. Currently, about one third of the irrigated land in the world has too much salt in it. Irrigation has taken a heavy toll on good land.

So, basically, how people use the land seems to be a bigger factor in the decrease of productive land than weather. Of course, weather extremes, like no rain or too much rain, can add to the problem. However, the weather is not the main reason for the problem. Some of the extremes in the weather caused by global warming can make the situation worse for people who live in these dry areas. But the weather alone is not the main issue.

The decline of productive land is a worldwide problem. Currently, about one third of the world's land area is considered unproductive because it is too dry and damaged.

OK, so that's the bad news. Now let's turn to the good news. What are countries doing to help preserve land as a resource? As **experts** learn more about this worldwide problem, they have tried to find ways to address it. Right now there are several organizations, the United Nations for one, that are working to help people. They try to help countries or communities look at their specific problems and figure out what possible changes they can make to protect their land. They talk to people about their farming methods, their animals, and how they use trees and other resources. Then they suggest changes that might **alleviate** some of their problems. Farmers might try to grow genetically engineered crops that don't hurt the soil as much, or plant new trees, or raise fewer animals, or

build new irrigation systems that leave less salt in the soil. They look for local solutions that will work best for that country. This includes looking at what has been done traditionally and **implementing** modern farming methods in ways that respect the local culture.

So, let's review what we covered today. I mentioned that about one third of the available land worldwide has become dry and less productive. The main reason for land degradation is people's actions, including overgrazing by animals, overcutting of trees, and farming methods. As scientists learn more, we need to work to help countries make specific changes and for farmers to become better equipped so that they can preserve the good land that is left.

Let me just add that if we look at the estimates of what the world population will be fifty years from now—about 9 billion people—it helps us see that protecting the good land that's left needs to be a high priority.

I'll stop there. We'll continue with this next class. That's all for this afternoon.

Unit 10 It's in the DNA

TEACHER: Good morning. Today we'll talk about an important topic in biology—DNA and DNA testing. Can anybody tell us what DNA stands for?

STUDENT 1: de-oxyribonucleic acid. . . .

TEACHER: Right. It's the molecule that carries genetic information in all living cells. Now first, we'll look at what DNA is and when it was discovered. Then, we'll look at DNA testing and several **applications**, or uses of testing. This is an exciting **topic** for biologists because the more we learn about DNA, the more we see how science may change our lives—from healthcare to our relationships. OK, what does DNA look like?

STUDENT 1: It looks like two strings, kind of wrapping around each other.

TEACHER: Yes, exactly. There's a simple drawing of one in your book. As you can see, a molecule of DNA consists of two strands of chemical **compounds** arranged in a twisted pattern. Inside the human **cell** are chromosomes. The DNA is organized in twenty-three pairs of chromosomes in the cell. Genes are arranged on the chromosomes and these carry **fundamental** genetic information like hair color, eye color, or characteristics that aren't as **visible**, such as intelligence, and a lot more.

Scientists have been studying DNA for a long time. First, in 1860, Gregor Mendel made two important discoveries: tiny particles he called genes, and, that genes carry

information from cell to cell. Now this was really the beginning. Then, in 1953, J. D. Watson and Francis Crick discovered and described the DNA structure. Their work was so important that they received the Nobel Prize in 1962. For the first time, scientists could understand exactly how DNA tells the cells what to do. This **generated** more DNA research, and by the end of the twentieth century, scientists made other important discoveries. Probably the most important work was the Human Genome Project. The goal of the Human Genome Project was to complete the first reading of the human genome, the complete set of human DNA. Uh, this was a huge job, but after ten long years in June, 2000, the head of the Project announced that they had identified the complete set of human genes. Uh, this was a huge deal. Most people saw this as the beginning of a whole new **era** in DNA research. Scientists could read all of the genetic messages in the human body! This is, of course, a very brief history of the study of DNA.

All right, let's consider DNA testing. One important use of DNA testing is testing identity, which is also called DNA fingerprinting. Here's how a DNA fingerprint is done. Scientists take a small sample of someone's hair or skin, which contain DNA. Next, they treat the sample with chemicals and make a film, like a small photograph. On this film there is a visible **pattern** of black bars. This pattern of black bars is unique for each person. So, a DNA sample from your hair identifies you, it's, it's like your fingerprint; it identifies you and you only. I see a question. Miguel?

STUDENT 2: Does the DNA from hair or skin or blood all look the same?

TEACHER: No, not exactly. The DNA from your hair will look like hair DNA but it will be uniquely your DNA pattern. It's sort of like all noses look like noses, right? But your nose looks like your nose only.

Now I want to look at two **applications**, or uses, of DNA testing. First, how it can be used by doctors, and second, how it can be used by the police. Within healthcare, one important use is to identify potential for health problems. Researchers have found some genes linked to specific diseases. For example, Huntington's disease is linked to a defect in chromosome 4, and Alzheimer's disease is linked to a defect in chromosome 19. A genetic link means that doctors know that if someone has defects in these genes, they're more likely to get these health problems; their potential is **increased**. Notice, I didn't say "Researchers have found that some gene defects cause specific diseases." There is simply a link.

After doctors perform DNA testing, they can then decide the best way to use the information. For example, they may give medication to a patient to prevent a disease

from ever starting. Genetic testing can also be used to decide which medicine to give someone. This is called targeted medicine. To me, this is very exciting and promising. There are tiny differences in DNA from person to person. These differences can affect which patients will be helped by a drug, and who may be harmed by it. This is, uh, a tremendous advantage. It saves lives and money.

Now, let's look at how DNA testing is used by police. The police can use DNA fingerprints to identify and **trace** criminals. All they need is a small amount, or trace, of blood or hair from the crime scene. If the DNA samples from the crime scene and the suspect match, the results, at least in the United States, can be used as evidence in court. So, DNA testing can be used to help put someone in prison. In much the same way, DNA testing can be used to help innocent people in prison. People in prison can now try to use DNA testing for crimes that happened, say, ten years ago. If their DNA fingerprint doesn't match the DNA fingerprint from the crime scene, this can help them get a new trial and perhaps get them out of prison.

As you can see, there are benefits to DNA testing. However, there are also some concerns that this type of information might be used against us in the future.

Now let's consider how DNA testing could be used against you. What if a company you wanted to work for asked you to take a DNA test? And what if your DNA test showed that you had a gene defect linked to a certain type of cancer? Would the company decide not to hire you? People also worry about health insurance. They're afraid they might not be able to get health insurance if their DNA test shows they're at a higher risk for certain diseases. As a result, in the United States, some laws have been passed to protect the privacy of medical records.

Now DNA testing has other possibilities that we won't discuss today. But in any case, many people think about the negative uses of testing—the fear that it will be used against people or to create "perfect" babies. Others think about police being able to trace criminals and possible advances in healthcare. But, another way to think about it is that it tells us more about who we are, and that's the goal of biology—to understand nature.

I guess I'll stop there for today. In the next class, I want to talk in more depth about uses of DNA testing by doctors. OK, we'll start there next time. That's, uh, that's all for today.

Unit 11 Staying Healthy

TEACHER: Good afternoon. Have you heard in the news that there is a new **outbreak** of Ebola in Central Africa?

This outbreak is an example of what we're going to talk about today.

There has been plenty in the news about *medical* problems around the world. There are new strains of malaria, West Nile virus, ongoing news about AIDS. It seems the *incidences* of many contagious diseases are increasing, even with the great progress being made in healthcare. So there are many challenges for doctors and healthcare workers. As future public health workers, it's important for you to have a realistic view of these challenges, and also to develop a sense of optimism in meeting them. Why are diseases spreading more rapidly? Well, we are traveling *overseas* more than ever before. As more and more people travel, infectious diseases are *transmitted* more often and more quickly. How many of you traveled overseas in the past six months? . . . A lot of you. Where did you go?

STUDENT 1: To Taiwan.

TEACHER: How about you?

STUDENT 2: I went to Turkey.

TEACHER: And you?

STUDENT 3: Brazil.

TEACHER: So you see, just among us, we've probably been around the world recently! Along with these *infectious* diseases, there has been an increase in the number of people with allergies and breathing problems. Some believe this is due to pollution. Are any of you *allergic* to anything? . . . Yes, see a lot of you are. I know I am.

To understand these problems, it helps to understand what our *immune* system is and why the world we live in makes our immune system work very hard. Let me explain briefly what the immune system is. The immune system is the system in our bodies that fights diseases. The job of the immune system is to defend the body against things that may harm us, that may make us sick. For example, when someone sneezes on us on a crowded train . . . Oh, I hate when that happens! How healthy we are depends on how well we can fight and destroy the "bad guys," the germs or *microorganisms* that can hurt us. To have immunity means to be able to fight them off. It's very important to have a strong immune system if we want to stay healthy.

Here's a key point. We develop immunity to what is around us, to what we are *exposed* to. So if you live in Tokyo, you develop immunity to microorganisms in Tokyo, if you live in Paris, you develop immunity to what is dangerous in Paris, and so on. *Adapting* to the environment takes time. This is called adaptive immunity. Adaptive immunity means people who are exposed

to the causes of a disease develop the ability to fight the disease. So, for example, a girl gets a disease, say chicken pox. That girl develops immunity to chicken pox, and she won't get chicken pox again.

Now, how about someone from the U.S. taking a boat trip on the Amazon River, or someone from Taiwan traveling to Africa? These people are in new places, places that have bacteria and viruses that cause diseases. But the person's immune system hasn't adapted to fight those diseases, so the person might get sick. Then if that person returns home from a trip and is sick, he or she might be contagious. But the people back home won't have the ability to fight the disease either, their immune systems won't know how. This is how infectious diseases can be transmitted to other people. To *resist* a disease, someone must have immunity. That's very important.

We can have immunity by developing it, like the little girl with chicken pox, or by being immunized. One way to get immunized is to get an immunization shot, for example, a shot for cholera. People often get shots before they travel to build up their immunity. This does help, but in any case, our immune systems have to work harder and harder when we come into contact with new microorganisms.

In recent years, we have learned more about a variety of immune system problems. Probably the most well-known is AIDS, or acquired immune deficiency syndrome, caused by HIV, human immunodeficiency virus. Most of us know the terms AIDS and HIV, but let's look at what the letters stand for. The I-D in AIDS stands for immune deficiency. "Deficient" means lacking, to not have enough of something. So people with AIDS lack immunity. They can't fight infections or diseases.

Now, back to allergies. A lot of people don't think of allergies as being an immune problem, but they are. In fact, allergies are the most prevalent immune problem we have today. An allergy is a reaction to something that shouldn't normally affect people. Allergic reactions are really an action of the immune system. As I said earlier, the immune system's job is to protect you from things that are dangerous to your health, things like the germs on the subway or bus. When you have an allergic reaction, it's a signal that the immune system is working too hard. Another way to think about it is that the immune system makes a mistake. The mistake is that it fights to protect you against something that is not dangerous to you, like cats, flowers, or grass.

Allergic reactions like sneezing, red itchy eyes, or difficulty breathing can make people uncomfortable, but are common and generally not too serious. However, some people can develop a much more serious reaction that

affects the whole body. This is called an anaphylactic reaction—A-N-A-P-H-Y-L-A-C-T-I-C. This can be very dangerous. In fact, someone can die if no medicine is given to stop the reaction.

We treat allergies the same way that we try to prevent infectious diseases. We try to build up the immune system by introducing small amounts of the allergen to the body. This makes us less sensitive to the allergen and teaches our bodies not to react so strongly.

Well, let's conclude this here. We all have some immunity challenges. These challenges won't go away anytime soon because we are going to continue to travel, and so on. But, we can take some control of the situation by being aware that the various diseases, allergies, and environmental illnesses are linked at some level; they all have to do with our immune system. Then we can take some positive steps. We can try to live a healthy lifestyle by eating well, exercising, controlling stress, and being happy. Yes, some research shows that happy people are healthier. And, of course, by being aware of the risks we face when we travel in countries that are very different from our own. Are there any questions? . . . Cynthia.

STUDENT 1: So when you have an allergy to something, like cat hair, you're saying that you can cure it by becoming healthier?

TEACHER: Yes, it helps to be in good health. That will reduce the symptoms.

STUDENT 1: Then can you avoid getting some disease like cholera or AIDS by staying healthy and having a strong immune system?

TEACHER: Well, perhaps, but some microorganisms are so strong that they can attack even very healthy immune systems. . . . So, our immune systems protect us. We can develop immunity to diseases by being *exposed* to them, by adapting, or by getting immunized, usually by shots. Allergies are the most common immune system problem. In an allergic reaction, the immune system is working to fight something that doesn't really cause us harm. And finally, a healthy lifestyle can help us build up our immunity. We'll stop here. Please read the next unit for next time.

Unit 12 Prepare, Prepare

TEACHER: Good morning, everybody. Did any of you hear about the earthquake in California yesterday? You did? Well, fortunately, no one was seriously hurt. Today, I want to talk about what can be done in these types of situations. In the urban planning professions, we need to know the scope of urban problems and make plans—in advance—for dealing with them.

We'll start by talking about the difference between natural *hazards* and natural *disasters*. I'm going to give you some ideas about planning, about preparing for a natural hazard.

OK, first some background. Let's look at what I mean by natural hazards. Natural hazards are things that happen in nature that can be dangerous to us—like earthquakes, typhoons, hurricanes, tsunamis, fires, mudslides, volcanic eruptions, avalanches, floods, and tornadoes . . . many natural hazards. A hazard, then, is something that can be dangerous.

Now, I want to make a distinction between a natural hazard and a natural disaster. As I just said, with a natural hazard there is the potential for a lot of damage. In contrast, a natural disaster means terrible things do happen and normal life is interrupted. People are killed; there is a lot of destruction. Disasters are what we hear about on the news.

You know as well as I do that we can't stop earthquakes or hurricanes. So, I want to focus on ways we can *limit* the impact, how we can prepare to significantly reduce deaths, injuries, and damage when they occur. Preparing is vital. What a country does to prepare is based on the natural hazards that occur in that country.

Now let's consider planning. It's not easy to *initiate* an emergency response plan. There are many things to consider. At a *minimum*, it takes scientific information, money, and cooperation between scientists and the government of a country. Scientists and governments need to share information. This isn't always easy to do—for a number of reasons.

First, a country may not be able to use scientific information because it doesn't have the money. In a perfect world, governments would have all the money that they need, but in the real world they don't, so governments have to set *priorities* for spending. Governments, especially in developing countries, often have to choose between taking care of problems they have now, like needing new roads and schools, and spending money to plan for problems they might have if a natural disaster strikes. A great example is building materials. Scientists know that building materials are very important in minimizing the destruction caused by natural disasters. Some governments are aware that these materials will save lives, but they do not have the money to use them.

Second, governments have to decide how and when to use information from scientists. Scientists can't say definitely, 100 percent, that a storm will happen, or exactly when it will happen. Their information is not *precise*. So, a government has to decide what to do if the scientific data tell them something is likely to happen. It can

wait and do nothing, or it can tell people to prepare. . . . Now let's suppose the government tells people to leave their homes. So they do, and it costs a lot of time and money for people to leave. What happens if there is no earthquake, or only a very small earthquake? Will people be willing to leave the next time the government tells them to?

Before I talk more about planning, I'm going to tell you about two volcanic eruptions. Think about how planning, or lack thereof, was a factor in both. In November 1985, the volcano Nevado del Ruiz **erupted** in Colombia. For one year before this, the volcano had been making noises. Scientists knew that the volcano might erupt, but they could not say when it would happen. The volcano kept making noises, but the people living nearby didn't leave. Scientists had made maps of the most dangerous areas and given these maps to the government. The government, however, wasn't able to use the information before Nevado del Ruiz erupted. When the volcano erupted, it melted snow and ice at the top of the volcano and suddenly a lot of water rushed down the sides of the volcano, causing huge mudflows. This is when disaster struck: The mudflows moved quickly through several towns. More than 25,000 people were killed in a very short time. They weren't prepared. This was a major disaster.

The second example is the volcano that erupted in the late 1990s on the island of Montserrat in the Caribbean. It had been inactive for over a hundred years, but in 1995 it started making noises. Scientists watched the volcano very closely, and told the government what was going on. The government told the people who lived nearby that they had to move. So, the people were **evacuated**. From 1995 on, the volcano continued to be active. After five years, however, only about nineteen people had been killed. A major disaster was avoided.

Now let's consider these two examples. From the information we have, we know that one country was better prepared than the other. We don't know why. There could be many reasons. It's complicated, and I don't want to sound too critical here, but we can see that Montserrat's plan made a huge difference: Only nineteen people died there, while twenty-five thousand people died in Colombia.

OK. Let's turn now to initiating an emergency response plan. What basic things do you think any country needs in a plan? What's the first thing? Yes, Allen.

STUDENT 1: Knowing what's going to happen.

TEACHER: Well, yes, but, uh, as we discussed, we can't know with 100 percent certainty what's going to happen. The first stage is really made up of two parts: gathering information (doing research), and planning how to provide for people's basic needs for food, water, and so on. First, scientists need to gather information from all over the world about the type of hazards that occur in their country. Then they can use the information from their research to try to **predict** what will happen in the future, and plan accordingly. For example, Japan uses this type of information about earthquakes when it makes new buildings, roads, and so on. This is difficult because the research cannot give them precise information.

In the second stage, the government must be prepared to provide for people's basic needs if there is a natural disaster. They need to do a minimum of two things. They need to organize enough emergency supplies, such as food, bottled water, medicine, and so on, *and* they need to communicate to the people beforehand about where these supplies are located. People need to know where to go. The second stage also covers exactly what everyone needs do immediately after a natural disaster occurs—police, emergency rescue workers, citizens, et cetera—and where they should go, how to get there, and so on. This **enables** people to help themselves. So, the second stage involves providing information and supplies to people.

The third stage of an emergency response plan is to **recover**. This means planning for what to do in the days and weeks following the disaster, and how the government will enable people to return to normal life after the damage is done. It may take years to rebuild after, say, an earthquake. The plan should include who, when, and how. For example, who will rebuild houses and roads, when it will be done, and how it will be paid for.

This is only a brief introduction to making a plan. We can't stop natural disasters; they're going to happen. But we can limit the damage they cause. In the next class, we're going to discuss what countries are doing to build safer buildings in earthquake areas. We'll talk about the materials being used. If you have any questions, come see me.